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EXAMINER

VALONE, THOMAS F

ART UNIT PAPER NUMBER

2858

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/530,704

Applicant(s)

WU, WEI

Examiner

Thomas F. Valone

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 7-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 12-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 April 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/8/05
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Group I in the reply filed on 1/18/06 is acknowledged. The traversal is on the ground(s) that no serious burden would be present. This is not found persuasive because Examiner respectfully disagrees and maintains the restriction requirement because of the serious burden due to separate classification which the inventions possess. Separate classification necessitates a different examiner prosecuting the nonelected invention. The requirement is still deemed proper and is therefore made FINAL. Claims 7 – 11 are thereby withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim.

### ***Drawings***

2. The drawings are objected to because it is not clear in Figure 2 whether the amplitude (Volts or Amps) or frequency (Hz) is plotted on the Y-axis (ordinate). If amplitude is intended, it is suggested that the Y-axis be labeled, "Amplitude of a specialized frequency" and (Volts) or (Amperes) added to the label. If frequency is shown by the bar graphs, then (Hz) would be the requisite appropriate label, to clearly indicate the units of measurement. The X-axis (abscissa) would also benefit from having "(Pi)" or "(P1 to Pn)" added to the label, as is best understood. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should

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include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

3. The disclosure is objected to because of the following informalities:

1) The term "value" in line 18 of p. 2; line 30, p. 7, and elsewhere is not clear.

The terms regarding EMI for this invention should be unambiguous. For examining purposes, "value" is interpreted to mean "amplitude."

2) The terms "trace out," "tracing out" and "traced out" in line 30, p. 1; line 20, p. 3; line 30, p. 7, and elsewhere is not clear. As best understood, no trace or tracing is actually performed. For examining purposes, "trace" is interpreted to mean "find."

3) The phrase "not at its maximum value" in line 17, p. 6 seems to contradict line 8, p. 6 where "the test point  $P_i$  that bears the maximum EMI value" is found out and

mapped onto a physical location. It is suggested that “not” be deleted since the spots (4, 10, 13) of interest on the time domain waveform appear to possess maximum values, as best understood.

Appropriate correction is required.

### ***Claim Objections***

4. Claim 1 is objected to because of the following informalities:

1) The method step of “processing” in line 4 does not appear to be an independent step when viewed in light of the specification. The steps of (1) obtaining (acquiring), (2) transforming (converting), (3) comparing and (4) locating (analyzing) may be inferred from p. 4 – 5 of the disclosure, in that order, while the “signal after transforming is processed by the frequency component comparison” appears in line 28 of p. 7, effectively making “processing” and “comparing” and equivalent single method step. For examining purposes, “processing” in line 4 of claim 1 is interpreted to mean “converting, comparing and analyzing.” It is suggested that the term “including” should be inserted between “processing” and “converting” in line 4 of claim 1.

2) The phrase “under specified EMI frequency” in line 5 has no antecedent in the claim. The only place where “specified” is used in the disclosure is on p. 3, line 7 where the maximum EMI is found “under a specified frequency” which seems to imply that specifying a frequency needs to be performed first. It is suggested that the method steps in claim 1 should include “specifying a frequency for testing” as a logical prerequisite to the step of locating the maximum EMI under a specified frequency. For

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examining purposes, "specifying a frequency for testing" is assumed to be a limitation in claim 1 prior to the limitation "under specified EMI frequency."

5. Claim 2 is objected to because of the following informalities:

1) The term "tracing" in line 8 is not clear because, as best understood, no trace or tracing (connecting of points) is actually performed. For examining purposes, "tracing out" is interpreted to mean "finding" or "locating."

2) The term "value" in line 8 is not clear because, as best understood, value can be many conflicting characteristics of EMI. For examining purposes, "value" is interpreted to mean "amplitude," in light of the specification, p. 6, line 17.

3) The method in line 10 of "...alternatively, the electronic components...should be...by checking different spots.." is not clear because it is not understood what alternate operation is claimed that needs to be performed besides looking for the test point with the maximum EMI, since even the corresponding disclosure (paragraph (4) on p. 5 beginning with "Alternatively") has an incomplete sentence where this method is described. For examining purposes, the last four lines of claim 2, beginning with "alternatively" are interpreted as "alternatively the time domain signal is compared with the time/frequency message" in light of the specification (p. 7, last line and p. 8, top line).

6. Claims 4 and 13 are objected to because of the following informalities: The term "the measurement device" in line 2 of both claims has no antecedent basis in the claims. It is suggested that the term be changed to "a measurement device."

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7. Claim 12 is objected to because of the following informalities: The term "could be" in line 1 does not set clear metes and bounds for the claim and should be changed to -- is a --. For examining purposes, "could be" is interpreted as "is a."

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1 – 6 and 12 – 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schaefer (5,446,393) in view of Mayor (6,700,388) and Silvester.

Regarding claims 1 – 4, 12, 13: Schaefer teaches a method for measuring electrical signals with a probe 20, with contact pin 19, that enables the acquisition, through a connection to a measurement device (electrical test instrument, col. 5, line 9 and col. 2, line 41), of a set of time-domain waveforms from a group of test points on an EUT (test point on electrical assembly, col. 5, line 10 and col. 3, lines 5 – 23). Schaefer includes a coaxial shielded cable probe modification for high frequency signal isolation (col. 5, line 55), eliminating EMI from sources other than the point under test (col. 5, line 64). Schaefer also indicates voltage for the signal waveform (col. 5, line 63) as in claims 3 and 12.

Schaefer does not explicitly specify the equal spacing of the test points nor the numbering of the test points. Schaefer does not address the converting, comparing, and analyzing of the waveforms.

Mayor teaches the acquiring or obtaining of a set of time domain waveforms (analog input signal received, col. 5, line 25) from an equipment under test (electronic device under test, col. 5, line 26) via a "conductor, such as a wire or cable" (col. 5, line 29) as well as converting (transforms into frequency domain, col. 3, lines 50-55), comparing (col. 5, line 3), and analyzing (col. 4, line 44) the waveforms, the test point bearing the maximum value (measured peak voltage, col. 10, line 45) under a specified EMI frequency (selected frequency sub-band, col. 10, line 30), being the location of the EMI source (indicative of the EMI, col. 10, line 46). Mayor also identifies the time domain waveform possessing a voltage amplitude (108 in Fig. 4) as in claims 3 and 12.

Schaefer as modified by Mayor does not disclose a group of equally distributed test points on an EUT where the test points are well-numbered.

Silvester teaches the application of finite element analysis to electrical fields, including one, two and three dimensions. The well-known process of performing the simulation analysis, with or without software, involves equally spaced elements that are well-numbered, which, known to those skilled in the art, also can be made as small as a point if desired (p. 7, line 3 – 5). This is also relevant when the claims are viewed in light of the specification where the option of simulating the EUT with software is an alternative to physically testing the equally spaced test points (p. 2, line 13).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used Schaefer's EMI probe with a measurement device to acquire a set of time-domain voltage waveforms from test points on an EUT with Mayor's method and apparatus for EMI measurement to convert (process by transform),



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compare, and analyze the waveforms, since Mayor indicates a wire or cable input (col. 5, line 29) which normally requires a probe, to one skilled in the art to which this invention pertains, with Silvester's teachings of the technique and reason for testing a group of equally distributed test points with test points well-numbered, for the purpose of finding the location of the EMI source.

Regarding claims 5, 6, 14 and 15, the teachings of Schaefer are reviewed above.

Schaefer does not teach the use of a Fourier transform or a Short Time Fourier Transform.

Mayor teaches the use of a Fourier transform (col. 3, line 52) for transforming the time-domain signals into frequency domain signals, as in claims 5 and 14 and also preferably a fast (short time) Fourier transform (col. 7, line 37) as in claims 6 and 15.

Schaefer as modified by Mayor does not include the testing of equally spaced test points that are well-numbered, as applied to claim 1.

Silvester's teachings are reviewed above.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used Schaefer's EMI probe with a measurement device to acquire a set of time-domain voltage waveforms on an EUT with Mayor's method and apparatus for EMI measurement to convert (process by Fourier transform or short time Fourier transform), compare, and analyze the waveforms, since Mayor indicates a wire or cable input (col. 5, line 29) which normally requires a probe and Silvester teaches the reason for using a group of equally distributed test points with test points well-

numbered, to one skilled in the art to which this invention pertains, for the purpose of finding the location of the EMI source.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Terrell (6,529,020) treats peak values of EMI; Rogers (5,414,345) teaches EMI susceptibility testing; Carpenter (6,597,184) deals with EMI testing; Tannehill (6,841,986) teaches the use of a insulated probe for EMI testing.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas F. Valone whose telephone number is 571-272-8896. The examiner can normally be reached on 9 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on 571-272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Thomas Valone, PhD, PE

Patent Examiner

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571-272-8896



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